APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,070	09/11/2003	Zachary Merlynn Loafman	AUS920030432US1	6184

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EXAMINER
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ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	10/660,070	LOAFMAN, ZACHARY MERLYNN
Office Action Summary	Examiner	Art Unit	
	Duc T. Doan	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>15 June 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-21</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5,8-12 and 15-19</u> is/are rejected.

7)☐ Claim(s) <u>6,7,13,14,20 and 21</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>11 September 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-21 have been presented for examination in this application. In response to the

last office action, none of the claims have been amended. As the result, claims 1-21 are now

pending in this application.

Claims 6-7,13-14,20-21 are objected to.

Claims 1-5,8-12,15-19 are rejected.

Applicant's arguments filed 6/15/06 have been fully considered but they are not

persuasive. Therefore, the rejections from the previous office action are respectfully maintained

and restated below,

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in

section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the

manner in which the invention was made.

Claims 1-4,8-11,15-18 rejected under 35 U.S.C. 103(a) as being unpatentable over

Bonewick (A Slab Allocator) and in view of Printezis et al (US 6249793).

As in claim 1, Bonwick describes a method of squeezing slabs empty, a slab being a

block of allocated memory space (Bonwick's paragraph 3.2 lines 1-12), the method comprising

the steps of: determining whether a slab is to be squeezed empty (Bonwick's paragraph 3.2 lines

13-18 reclaiming unused memory when slab reference count goes to zero); The claim further

recites and precluding, if the slab is to be squeezed empty, data from being placed in any unused

space of the slab. Bonwick does not describe the claim's detail of precluding data during the

squeezed empty operation. However, Printezis describes a garbage collection mechanism that

runs concurrently with program execution capable of selecting objects of a region to be

reclaimed, when it detects the writing to objects in the region, suspending the program, redirects

the pointers of objects to point to locations outside the region, then restarts the program

(Printezis's Fig 9, column 7 line 58 to column 8 line 63). It would have been obvious to one of

ordinary skill in the art at the time of invention to include the garbage collection mechanism as

suggested by Printezis in Bonwick's system to redirect the pointers to outside of the memory

region being reclaimed thereby providing a large region of memory to be reclaimed for future

allocation (Printezis's column 8 lines 55-65).

As for claim 2, the claim recites wherein data is precluded from being placed in any

space in the slab that becomes unused anytime thereafter. The claim rejected based on the same

rationale as in the rejection of claim 1.

As for claim 3 the claim recites wherein the slab is de-allocated when the slab becomes

empty (Bonewick's paragraph 3.2 lines 13-18 describes reclaiming when reference count is

zero).

As for claim 4, the claim recites wherein precluding data from being placed in an unused

space of the slab includes disclaiming the unused space (Bonewick's paragraph 3.2 describes

reclaiming a slab of memory, thus including any left-over bytes that are not assigned to objects).

Claims 8,15 rejected based on the same rationale as in the rejection of claim 1.

Claims 9,16 rejected based on the same rationale as in the rejection of claim 2.

Claims 10,17 rejected based on the same rationale as in the rejection of claim 3.

Claims 11,18 rejected based on the same rationale as in the rejection of claim 4.

Claims 5,12,19 rejected under 35 U.S.C. 103(a) as being unpatentable over Bonewick (A

Slab Allocator), Printezis et al (US 6249793) as applied to claims 4,11,18 respectively and

further in view of Benayon et al (US 6249852).

As for claim 5, the claim recites wherein a collection of slabs is a pile, the pile having a

maximum amount of allowable memory space that can be allocated thereto. Bonewick and

Printezis do not describe the claim's detail of categorize slabs into a pile. However, Benayon

describes pools of memory in which each pool is provided for a specific object memory size and

a specific page list for every rounded object size (Benayon's column 2 lines 50-55, column 3

lines 58-62). It would have been obvious to one of ordinary skill in the art at the time of

invention to include the memory pools mechanism as suggested by Benayon in Bonwick's

system to maintain separate page lists for every rounded object size, thereby reduce the number

of pages being touched during an allocation or de-allocation (Benayon's column 4 lines 43-54).

Claims 12,19 rejected based on the same rationale as in the rejection of claim 5.

Allowable Subject Matter

Claims 6-7,13-14,20-21 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

Response to Arguments

Applicant's arguments in response to the last office action has been fully considered but they

are not persuasive. Examiner respectfully traverses Applicant's arguments for the following

reasons:

As to the remarks on pages 7-9 concerning the claim 1's limitations,

A) Applicant's remark on page 7 indicates that squeezing a slab empty means forcing a

slab empty. Forcing a slab empty can be understood as the system dumping the data out of the

memory immediately (executing a command to flush data out of the cache memory, for example

in the case of system power outage, system forces data out of the cache memory). Examiner

cannot find any support in the disclosure for such forcing action, in fact the specification merely

teaches a de-allocation method in which the data in memory are not "forced" out, instead the

system waits until all data (data objects) in a slab no longer being used or being accessed by any

tasks then the slab is deallocated or reclaimed. Specification's Fig 2, page 7 line 24 to column 8

line 8 discloses using a reference count to keep track data in the slab still being used or no longer being used. The system will wait until all the data in the slab not being used, then emptying the slab.

In a similar manner, Bonewick teaches a method to deallocate a chunk of memory (i.e "slab"), when a chunk of data is identified for deallocated, obviously by a program that run deallocating and for defragementation of memory space, the program waits until all data in the "slab" no longer being used, then empty the chunk of data (Bonewick's 3.2), Bonewick further teaches a reference count that keeps track data in the slab still being used or no longer being used (when reference count is zero indicates data in the slab no longer being used; Bonewick's 3.2 paragraphs 3,4)

B) Bonewick does not disclose a step to bar the subsequent requests to access the data in the slab. However, Printezis discloses a method to reclaim data in the memory including step to bar subsequent requests to access the data in an area of memory that is identified for being reclaimed. The subsequent requests are diverted to another area of the memory, therefore the data in the reclaimed area are unused and ready to be emptied when they are no longer being used or referenced (Printezis's Fig 9, column 7 line 58 to column 8 line 63).

This teaching corresponds to the claim's "precluding, if the slab is to be squeezed empty, data from being placed in any unused space of the slab".

One of ordinary skill in the art would be motivated to apply the method of diverting subsequent requests as suggested by Printezis into Bonewick, since obviously it would reduce the waiting time for the data to be freeup as discussed in the above paragraph, and further more,

the area to be reclaimed can be quickly consolidated into a large contiguous region of memory

for future allocation (Priteziz's column 8 lines 55-65).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

When responding to the office action, Applicant is advised to provide the examiner with

the line numbers and page numbers in the application and/or references cited to assist examiner

to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The

examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER